REMARKS

Claims 1-3, 13-23, 25 and 27 stand rejected, with claims 9-12 objected to in the outstanding Official Action. Claims 7 and 8 have been cancelled, with claims 1-3, 5, 6, 9-16 and 20 amended. Accordingly, claims 1-6, 9-23, 25 and 27 remain in the application.

Attached hereto is a marked-up version of the changes made to the claim(s) by the current amendment. The attached page(s) is captioned "**Version With Markings To Show Changes Made.**"

The Examiner's acknowledgment of applicant's claim for foreign priority and confirmation that the U.S. PTO has received the certified copy of the priority document is very much appreciated. Additionally, the Examiner's consideration of the prior art submitted in applicant's Information Disclosure Statement is also appreciated.

The Examiner suggests in Section 1 of the Official Action that the Preliminary Amendment filed May 11, 2001 was improper because "the application was filed with claims 1-21." This conclusion is respectfully traversed.

The present application is a U.S. national phase entry of a PCT International application filed on November 12, 1999 which designated the United States. As the Examiner will note from the International Preliminary Examination Report dated March 2, 2001, the claims then pending in the International application were claims 22-28 as originally filed and claims 1-21 as amended on December 16, 1999. The U.S. national phase entry was on May 11, 2001, i.e. 6 months after the International Preliminary

Examination Report. Thus, the only claims which could have been transmitted to the U.S. PCT Receiving Office were claims 22-28 as originally filed and claims 1-21 as amended in the amendment filed December 16, 1999.

Accordingly, applicant's Preliminary Amendment which treated claims 1-28 was indeed completely proper and was directed to the claims which were pending at the time in the PCT application and which should have been indicated as pending in the United States. It is respectfully requested that the U.S. PTO correct their records to reflect the above information readily discernable from the International Preliminary Examination Report. The Examiners action upon pending U.S. national phase claims 1-28 is very much appreciated.

Claims 1-8, 15-19, 22 and 23 stand rejected under 35 USC §102 as anticipated by Tang (U.S. Patent 4,588,994). Applicant has amended independent claim 1 to recite in the penultimate line that the steering means causes the radiation beam to emerge from the transmission means "spatially offset" relative to the central axis in free space. While the Examiner suggests that the Tang reference teaches "the steering means causes the radiation beam to emerge from the transmission means offset relative to the central axis," there is no disclosure that it is offset spatially relative to the central axis.

The Tang reference teaches conventional ferrite block phase shifters in which the radiation energy is phase shifted in relation to the radiation energy entering the ferrite block. As a result, the increasing phase shifts in a plurality of shifters permits a radiation

beam formed by a large number of such phase shifters to be electronically steered at various angles.

However, in the Tang device, the radiation emitted by a single block is not steered or angularly offset relative to a central axis and instead merely radiates in a conventional fashion, but with a slight phase shift relative to other blocks. There is no disclosure in the Tang reference that the steering means of an individual block will cause the radiation beam to emerge spatially offset relative to the central axis, whether or not such beam is angularly offset. Thus, because Tang fails to teach the combination of elements in which the radiation beam is spatially offset, it cannot teach the subject matter of applicant's independent claim 1. As a result, claim 1 and all claims dependent thereon is believed clearly patentable over the Tang reference.

Claims 13, 14, 20, 21, 25 and 27 stand rejected under 35 USC §103 as unpatentable over Tang in view of Robertson (WO 97/29525). Robertson teaches an omnidirectional antenna in which a radiation beam illuminates a conical reflector in order to provide radiation over substantially 360° in azimuth. There is no disclosure or need for any beam steering in the Robertson reference and therefore Robertson is totally unrelated to the beam steering desires of the Tang reference.

Moreover, the Examiner has failed to provide any reason why one concerned with beam steering (as in Tang) would seek to employ any structure disclosed by Robertson (which is the direct opposite of beam steering and provides an even 360° beam). The Examiner has not met his burden of establishing a reason or motivation for combining the

Tang and Robertson references and therefore any further rejection of claims 13, 14, 20, 21, 25 and 27 in view of the Tang/Robertson combination is respectfully traversed.

The Examiner's indication that claims 9-12 contain allowable subject matter is very much appreciated. Applicant has rewritten claim 9 in independent form incorporating the limitations of originally submitted claim 1. Accordingly, claims 9-12 are now believed clearly in condition for allowance.

Having responded to all objections and rejections set forth in the outstanding Official Action, it is submitted that claims 1-6, 9-23, 25 and 27 are in condition for allowance and notice to that effect is respectfully solicited. In the event the Examiner is of the opinion that a brief telephone or personal interview will facilitate allowance of one or more of the above claims, he is respectfully requested to contact applicant's undersigned representative.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: _____
Stanley C. Spooner
Reg. No. 27,393

SCS:kmm
1100 North Glebe Road, 8th Floor
Arlington, VA 22201-4714
Telephone: (703) 816-4000
Facsimile: (703) 816-4100

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

1. *(Amended)* A device [(10; 71)] for controlling the direction of a radiation beam [(12; 70)], the device comprising:-

transmission means [(14; 71)] for transmitting the radiation beam [(12; 70)] from a radiation source [(62; 77)]; and

steering means [(28, 30, 32, 34; 72, 72a, 72b, 73)] for steering the radiation beam [(12; 70)];

[characterised in that] wherein the transmission means [(14; 71)] comprises a body of magnetic material having a central axis [(24; 78)] which forms an aperture through which the radiation beam [(12; 70)] passes, the central axis [(24; 78)] being parallel to and coincident with the direction of the radiation beam [(12; 70)] prior to incidence on the transmission means [(14; 71)];

and [in that] wherein the steering means [(28, 30, 32, 34; 72, 72a, 72b, 73)] causes the radiation beam [(12; 70)] to emerge from the transmission means [(14; 71)] spatially offset relative to the central axis [(24; 78)] in free space in a known direction.

2. *(Amended)* A device according to claim 1, wherein the beam [(12; 70)] is offset relative to the central axis [(24; 78)] and steered thereabout so as to define as angle θ between the central axis [(24; 78)] and the emergent direction.

3. *(Twice Amended)* A device according to claim 1, wherein the steering means [(28, 30, 32, 34)] comprises magnetic means.

5. *(Amended)* A device according to claim 4, wherein the gradient in magnetisation occupies a plane which is not perpendicular to the central axis [(24)].

6. *(Twice Amended)* A device according to claim 4, wherein the gradient of magnetisation rotates about the central axis [(24)].

9. *(Twice Amended)* A device [according to claim 1] for controlling the direction of a radiation beam, the device comprising:-

transmission means for transmitting the radiation beam from a radiation source; and

steering means for steering the radiation beam;

wherein the transmission means comprises a body of magnetic material having a central axis which forms an aperture through which the radiation beam passes, the central axis being parallel to and coincident with the direction of the radiation beam prior to incidence on the transmission means;

and [in that] wherein the steering means causes the radiation beam to emerge from the transmission means offset relative to the central axis in free space in a known direction, wherein the steering means [(72, 72a, 72b, 73)] comprises a ferrite material [(73)] arranged within a solenoid [(72, 72a, 72b)] so as to rotate a linearly polarised beam [(70)] about the axis [(78)].

10. *(Amended)* A device according to claim 9, further comprising a pair of polarisers [(75, 76)] arranged adjacent either end face of the ferrite material [(73)] so as to reflect or to allow the beam [(70)] to pass.

11. *(Amended)* A device according to claim 10, further comprising an isolator [(79)] arranged to prevent a reflected portion of the beam reflected from the polarisers [(75, 76)] from entering a horn [(77)] used to generate the beam [(70)].

12. *(Amended)* A device according to claim 11, wherein the isolator [(79)] comprises an absorbing material which absorbs that portion of the beam reflected from the polarisers [(75, 76)].

13. *(Twice Amended)* A device according to claim 1, further comprising a reflective surface [(64, 81)] located adjacent a face of the body [(14; 71)] from which the beam [(12; 70)] emerges.

14. *(Amended)* A device according to claim 13, wherein the reflective surface [(64; 81)] comprises a cone having its apex facing the face and its central axis coincident with the central axis [(24; 78)].

15. *(Twice Amended)* A device according to claim 1, wherein the beam [(12; 70)] is swept through 360° in a plane which is perpendicular to the central axis [(24; 78)].

16. *(Twice Amended)* A device according to claim 1, wherein the beam [(12; 70)] comprises microwave radiation.

20. *(Twice Amended)* A communications unit [(60)] incorporating a device according to claim 1, and which includes radiation receiving means, modulation and demodulation means for modulating and demodulating information onto and from the radiation beam [(12; 70)].